

RHIC Machine/Detector Planning Meeting

14 Jun 05

Agenda

(if not covered in time meeting)

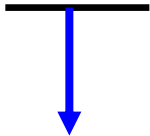
- **Experiment issues**
- **Accelerators Issues (Bai)**
- **Other business**

Planning Meeting Web Site: http://www.c-ad.bnl.gov/esfd/RMEM/rhic_planning.htm

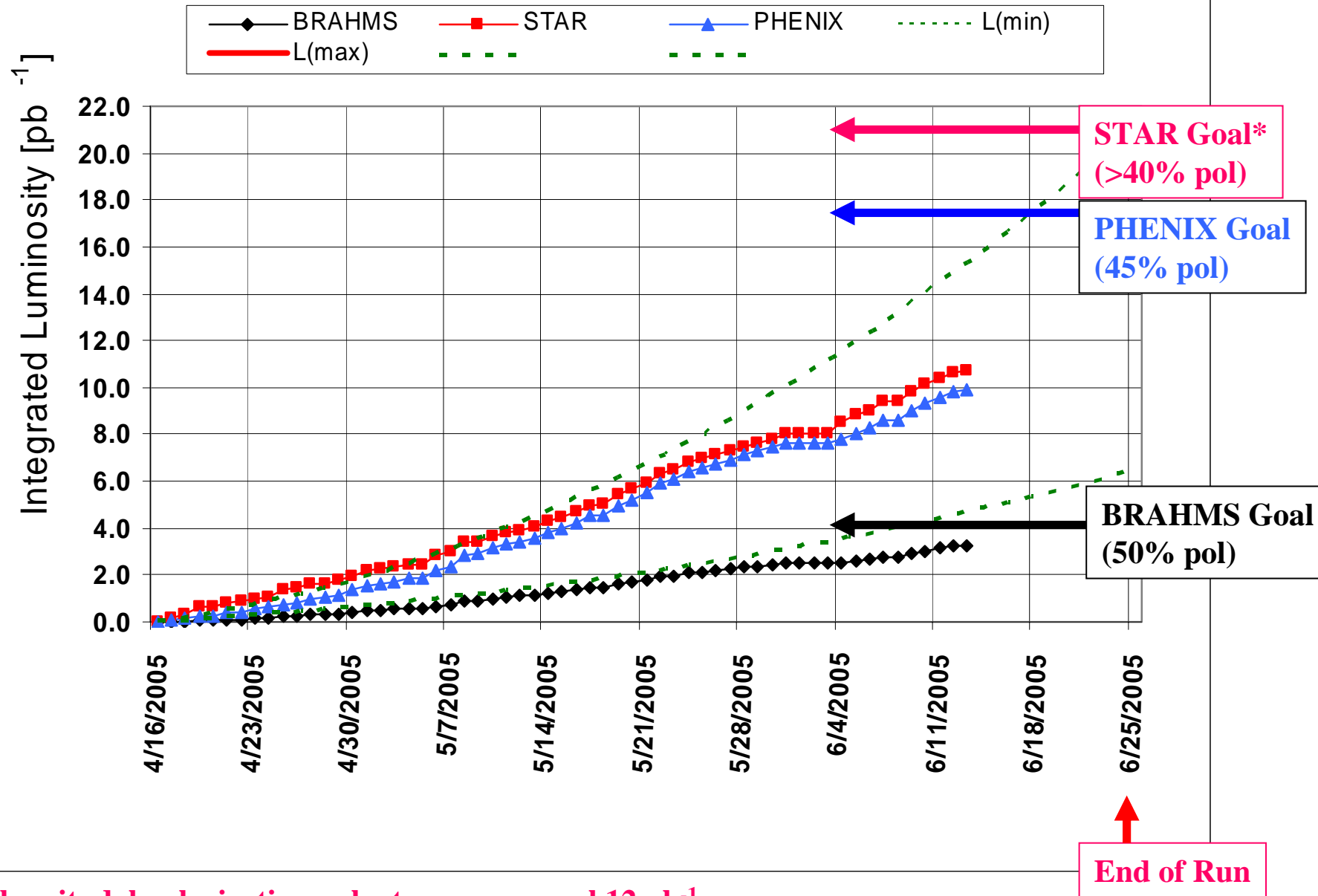
RHIC Machine/Detector Planning Meeting

- Details – as run/planned

- *11 Jan – Physics with Cu-Cu began*
- *7 Mar (0800) – end 200 GeV/n Cu-Cu*
- *7-9 Mar – Setup 62.4 GeV/n Cu-Cu*
- *9-15 Mar - 62.4 GeV/n Cu-Cu Physics*
- *10 March – Physics begins*
- *15 Mar – 8 hours at injection energy*
- *15-22 (1400) Mar - 62.4 GeV/n Cu-Cu Physics*
- *22 (1400)-24 (0800) March Cu-Cu Physics at RHIC Injection*
- *24 Mar (0800) – End of 10.3 week Cu-Cu run, 8 hr maintenance*
- *24-30 Mar – begin 3 week pp setup*
- *30 Mar - 1 Apr 05 Cold Snake/Jet Installation/CNI etc*
- *1-16 Apr – complete 3 week pp setup (7 April, overnight stores for experiments started)*
- *17 Apr – Begin 10.0 week pp Physics run*
- *31 May – Begin 410 GeV pp setup*
- *2-3 June – 2 shifts Physics at 410 GeV*
- *3 June – Back to 200 GeV pp*
- *25 Jun – end pp run (midnight 24 June), RHIC Run 5 ends*
- *30 Jun – Cryo switch to LN₂ complete, 32.0 weeks of RHIC cryo operation ends*

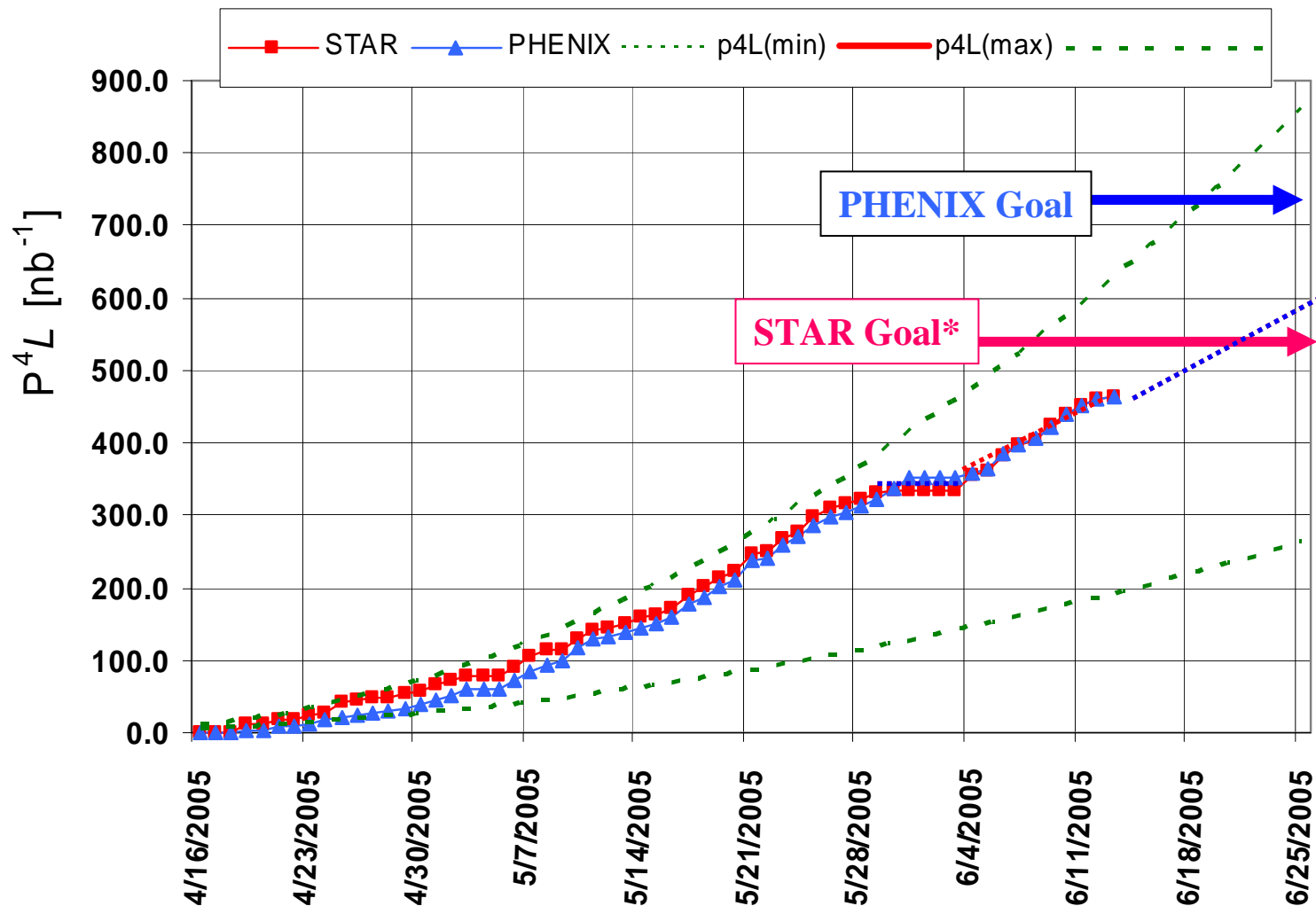


Run5 RHIC pp Delivered (Physics) Integrated Luminosity



* longitudinal polarization only, transverse goal 12 pb^{-1}

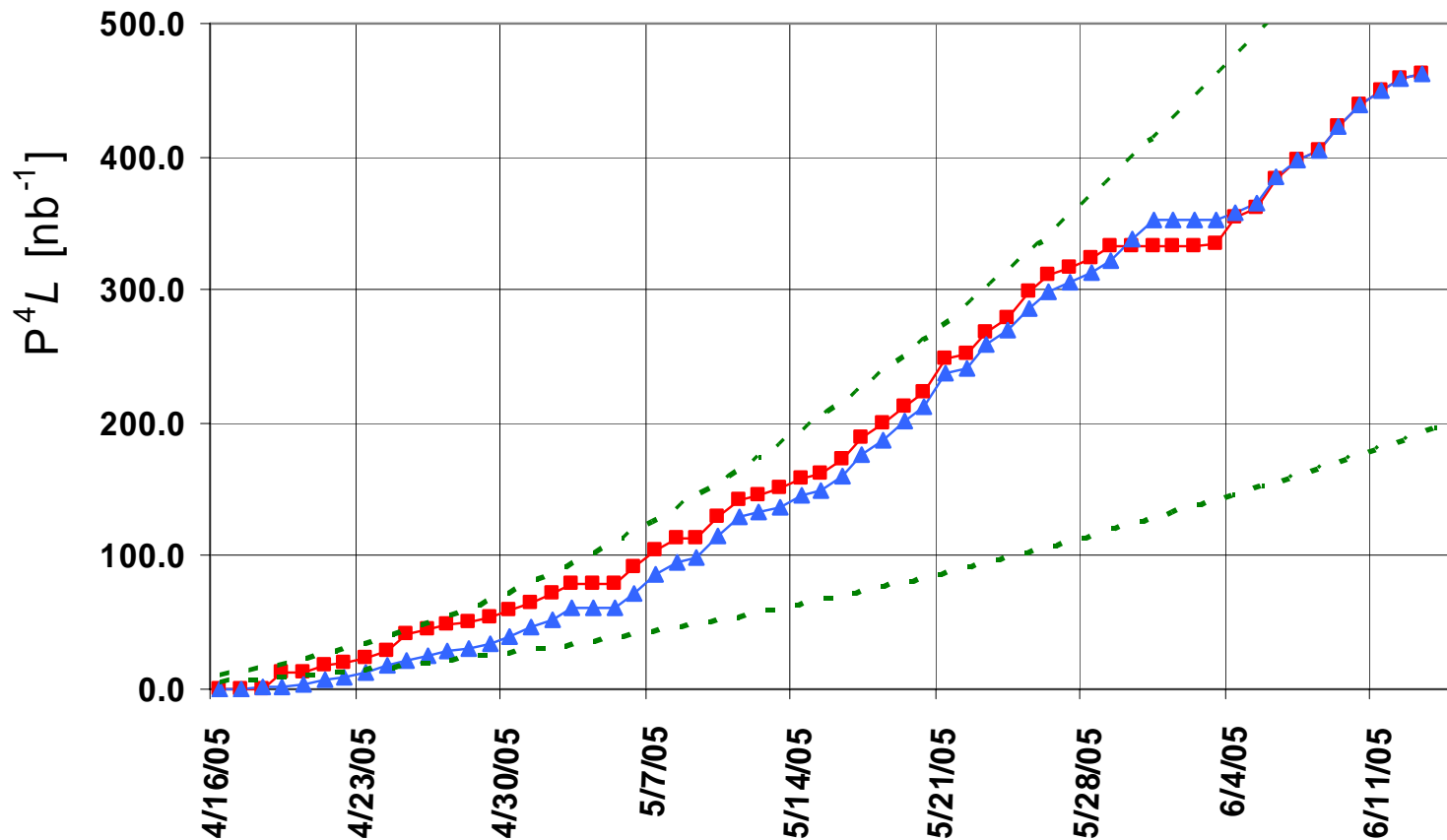
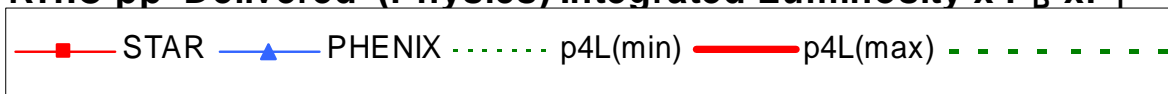
Run5 RHIC pp Delivered (Physics) Integrated Luminosity
(Transverse) $\times P_B^2 \times P_Y^2$



* longitudinal only, transverse goal $\sim 300 \text{ nb}^{-1}$

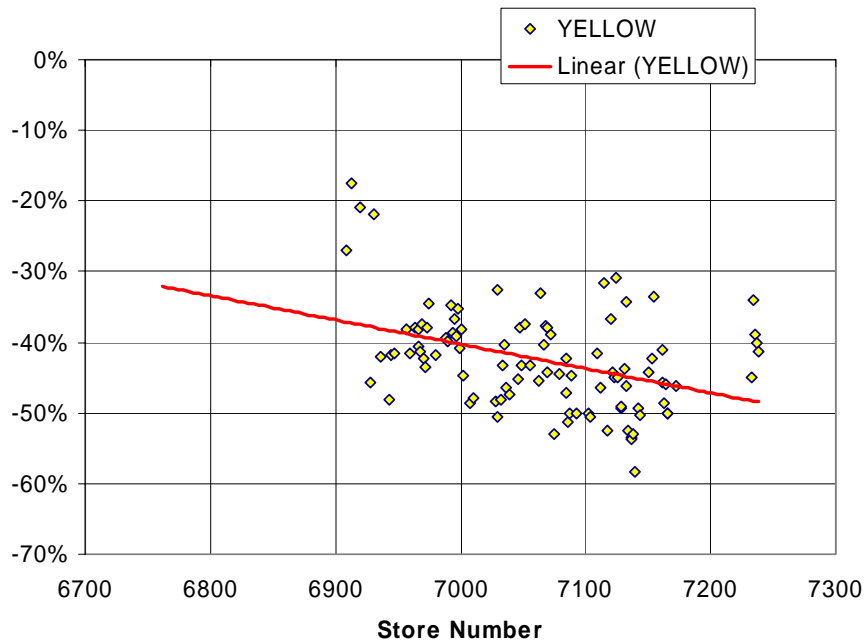
End of Run

Run5 RHIC pp Delivered (Physics) Integrated Luminosity x $P_B^2 \times P_Y^2$

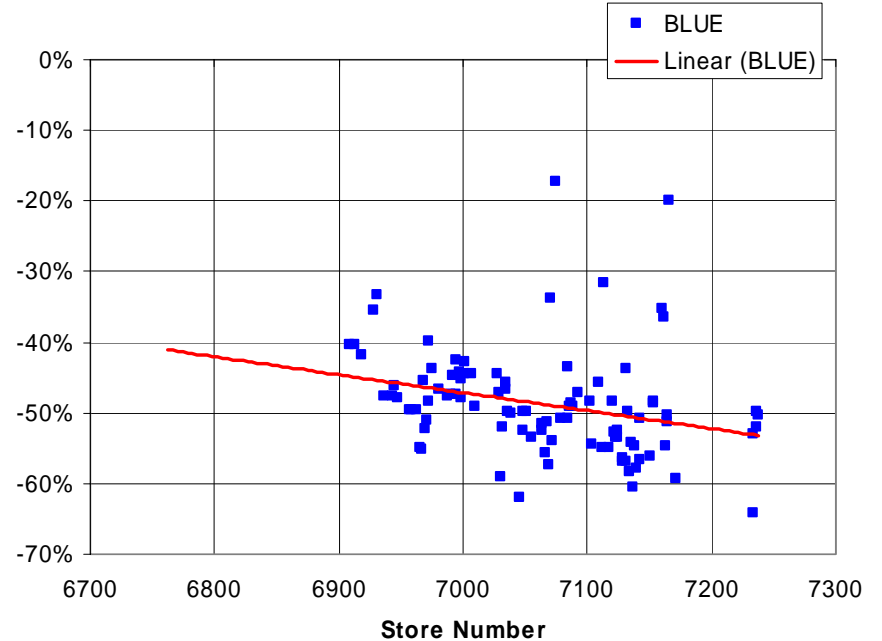


RHIC Run-5 pp 100x100 GeV




Polarization at store RUN 5



Polarization at store RUN 5



Schedule - subject to change

-  pending funding
-  schedule to be determined
-  setup/ramp up luminosity




[illegible]



















DRAFT - Not published

C-A Operations-FY06

14 Jun 05

Schedule - subject to change

-  pending funding
-  schedule to be determined
-  setup/ramp up luminosity




Program Element	FY 2006												
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
AGS-Booster-Tandem/Linac Startup													
			 30 weeks										
RHIC Cryo Cooldown/switch to LN ₂													
RHIC Cryo Operation													
RHIC Cryo off													
RHIC Systems Test (no colliding beams)													
RHIC with colliding beams													
RHIC Research with ?													
RHIC Research with ?													
NSRL (NASA Radiobiology)													
Shutdown (RHIC)													

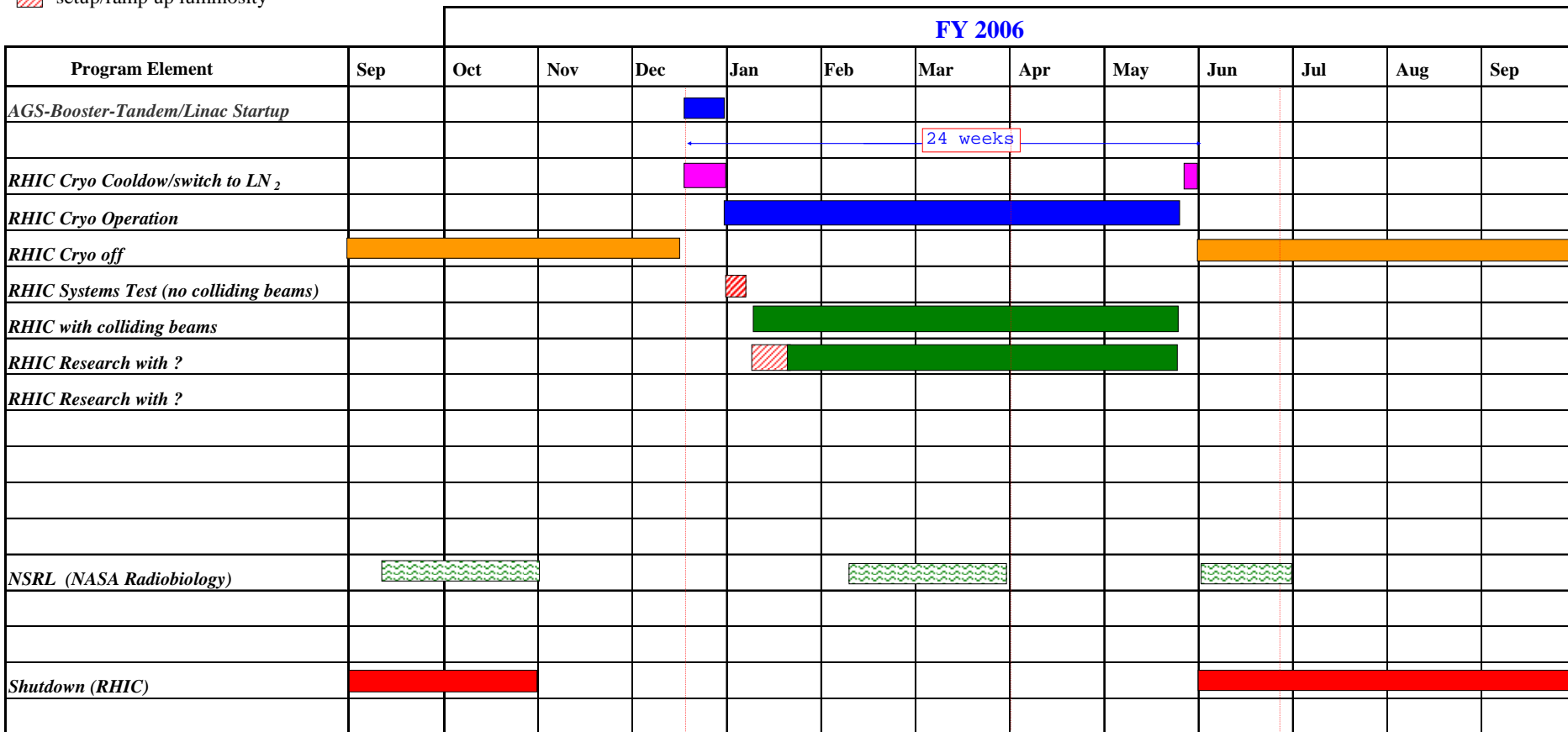
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C-A Operations-FY06

14 Jun 05

Schedule - subject to change

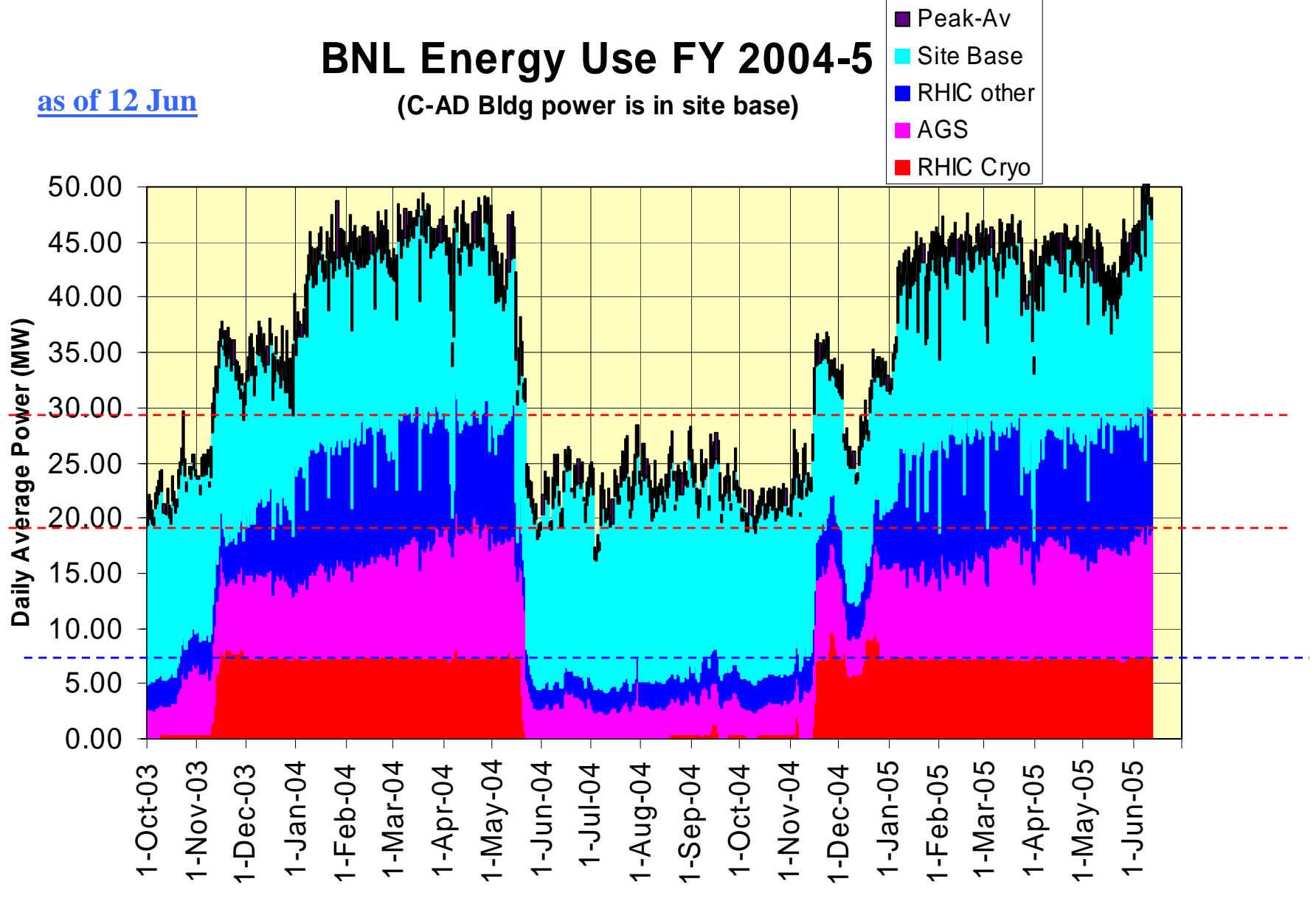
-  pending funding
-  schedule to be determined
-  setup/ramp up luminosity



BNL Energy Use FY 2004-5

as of 12 Jun

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RHIC Machine/Detector Planning Meeting

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RHIC Machine/Detector Planning Meeting

- ***RHIC Run5 As Run/Plan***

- **18 Nov 04 – Cool down begins**
- **23 Nov 04 – Blue Ring Cold**
- **28 Nov 04 – Yellow Cold**
- **29 Nov 04 – Short in D6-D8 dipoles Yellow Ring, schedule delay**
- **3 Dec 04 – quad bus-bus short in sector 12, shutdown to repair**
- **27 Dec 04 – short problem resolved, rings at 4 degrees again**
- **27 Dec 04 - “2 week” RHIC setup with beam began**
- **28-29 Dec 04 – found & fixed aperture problem in Yellow Ring (Al foil)**
- ***5 Jan 05 – “2 week” ramp-up with colliding beams began***

400 GeV pp Run Issue 20 Apr 05

Summary of discussion to date (Y. Makdisi)

➤ Machine issues

- 3 days to setup ramps
- 3+ days to establish adequate polarization
- Can start mid-May, before PAC meeting (3rd week of May) or after the PAC meeting
- Prefer 1.5 day PHOBOS physics at end of 200 GeV pp run

➤ Experiments issues

- PHOBOS – strong advocate for short physics run, above schedule OK
- STAR – decide after pp physics is established, priority is to integrate 4-6 pb⁻¹ of delivered luminosity (P>35%) at expense of 400 GeV development run if necessary
- PHENIX – priority is to integrate 1.5 pb⁻¹ of recorded luminosity (P>45%) before development run and push 1 day PHOBOS physics run to end of 200 GeV pp run
- BRAHMS – does not plan to run

➤ Status:

- Decision will be made at a later date

Experiment Goals RHIC Run 5, 100x100 GeV pp

(6/14/05 update)

- **BRAHMS**

- Began physics 17 April
- Luminosity Goal 2 pb^{-1} transverse polarized (50%) recorded
 - Translates to 4 pb^{-1} transverse polarized delivered
- $P_B^2 L$ (FOM) goal with 50% polarization = 500 nb^{-1} recorded
 - Translates to 1000 nb^{-1} transverse polarized delivered

- **PHENIX**

- Began min-bias physics 17 April, main physics 19 April
- Efficiencies (~actual):
 - Vertex cut = 0.43
 - PHENIX “uptime” = 0.72
- Luminosity Goal 5.5 pb^{-1} recorded,
 - Translates to $5.5 / (.72 * .43) = 17.8 \text{ pb}^{-1}$ delivered
- $P_B^2 P_Y^2 L$ (FOM) goal with 45% polarization = 226 nb^{-1} recorded
 - Translates to: $P_B^2 P_Y^2 L$ goal $226 \text{ nb}^{-1} / (0.72 * 0.43) = 730 \text{ nb}^{-1}$ delivered

- **STAR**

- Began physics 17 April
- Goal $\sim 20 \text{ MeVts}$ min-bias ($\sim 70 \text{ hrs}$)
- Goal $\sim 7 \text{ pb}^{-1}$ longitudinal polarized ($>40\%$) collisions, 21 pb^{-1} delivered (useable)
 - $P_B^2 P_Y^2 L$ Goal = 180 nb^{-1} recorded, 537 nb^{-1} delivered
- Goal $\sim 4 \text{ pb}^{-1}$ transverse polarized ($>40\%$) collisions, 12 pb^{-1} delivered (useable)
 - $P_B^2 P_Y^2 L$ Goal = 100 nb^{-1} recorded, 300 nb^{-1} delivered

Experiment Goals RHIC Run 5, 100x100 GeV/n CuCu,

Summary of Results (3/23/05 update)

- **BRAHMS**
 - Soft physics goal 0.8 nb^{-1} recorded, achieved $0.8 \text{ nb}^{-1} \rightarrow 100\%$ of goal
 - High-Pt goal 2.4 nb^{-1} recorded, achieved $1.75 \text{ nb}^{-1} \rightarrow 73\%$ of goal
- **PHENIX**
 - Integrated recorded luminosity goal (live BBCLL1) 2.9 nb^{-1} , achieved $3.06 \text{ nb}^{-1} \rightarrow 105\%$ of goal
- **PHOBOS**
 - Goal 1000M events to tape, achieved 500M $\rightarrow 50\%$ of minimum goal
 - Minimum Goal 400M events to tape, achieved 500M $\rightarrow 125\%$ of minimum goal
- **STAR**
 - Min bias, Goal 80M events, recorded 64.5M events $\rightarrow 80\%$ of goal
 - High Pt Trigger (BEMC HT18), Goal to sample $1\text{-}2 \text{ nb}^{-1}$, recorded $>1 \text{ nb}^{-1} \rightarrow 100\%$ of goal

Experiment Goals RHIC Run 5, 31.2 x31.2 GeV/n and 11.2x11.2 GeV/n CuCu and Final Results (3/30/05)

- **BRAHMS**
 - 62 GeV, Integrated Recorded Luminosity Goal $90 \mu\text{b}^{-1}$
Actual recorded luminosity $120 \mu\text{b}^{-1}$ (133% of goal)
 - 22 GeV, Goal 1.5M FFS triggers recorded
Actual recorded 1.9M triggers (126% of goal)
- **PHENIX**
 - 62 GeV, Integrated Delivered Luminosity Goal = $250 \mu\text{b}^{-1}$
Integrated Recorded Luminosity Goal $92 \mu\text{b}^{-1}$
Actual recorded luminosity $190 \mu\text{b}^{-1}$ (206% of goal)
 - 22 GeV, ~20M recorded events
Actual recorded 23.8M events (119% of goal)
- **PHOBOS**
 - 62 GeV, Goal 250M events to tape, minimum Goal 100M events
Actual recorded 115M events (115% of minimum goal)
 - 22 GeV, Goal 8M events to tape
Actual recorded 20M events (250% of goal)
- **STAR**
 - 62 GeV, Min bias, Goal >20M events to tape
Actual recorded 27.3M events (136% of goal)
 - 22 GeV, Min bias, Goal >1M events to tape
Actual recorded 3.85M events (385% of goal)

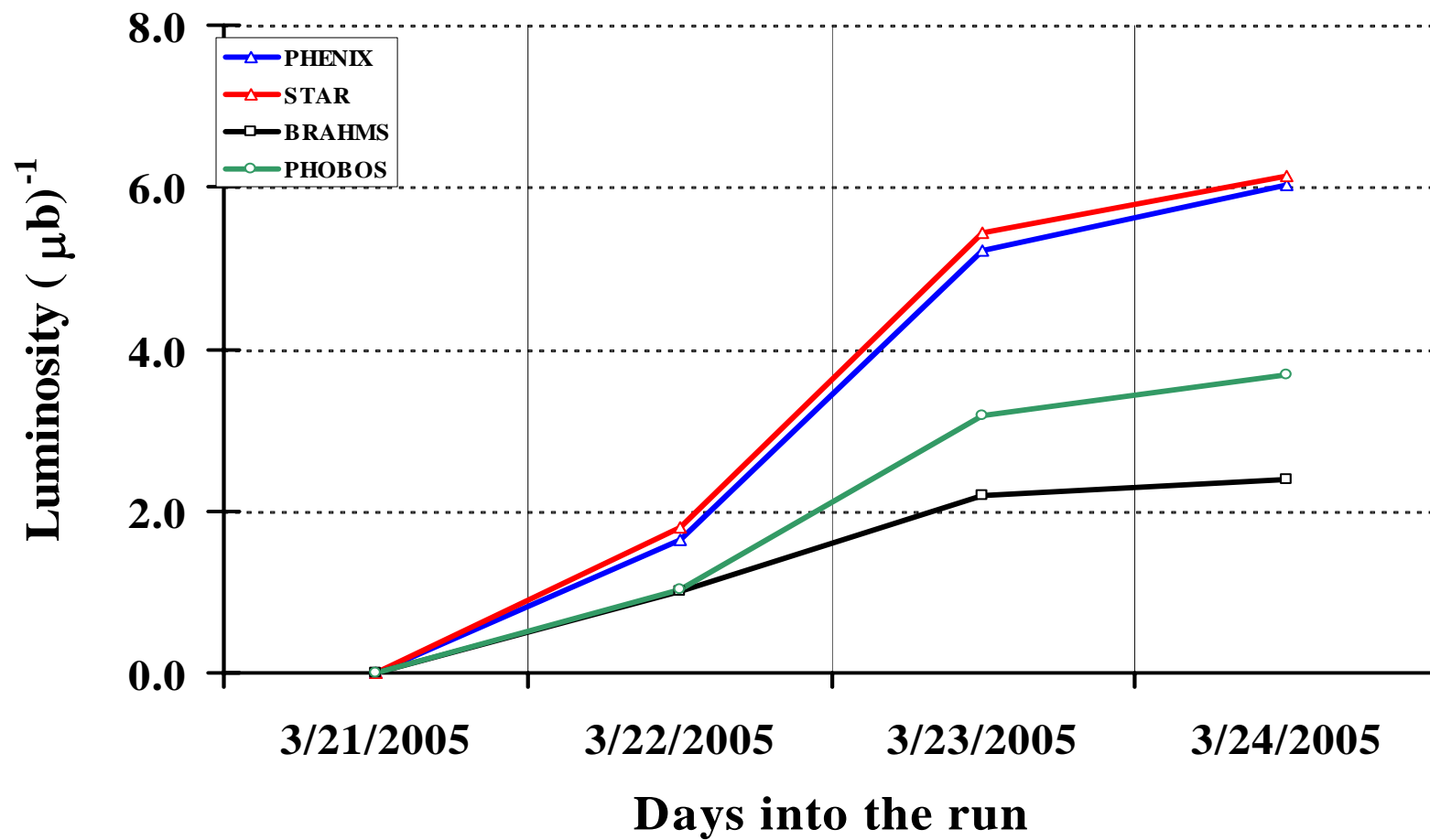
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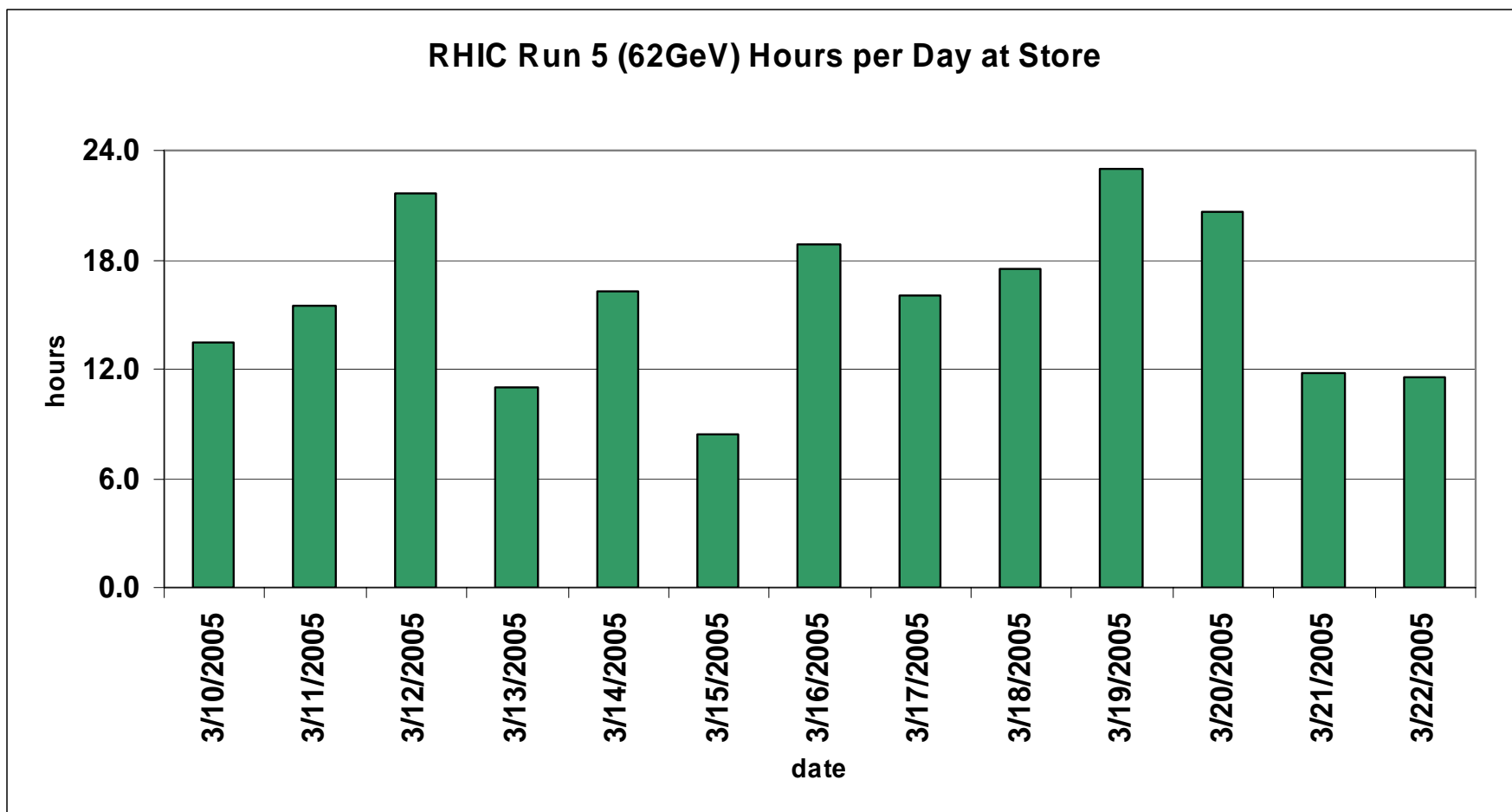
17 November 2004

PAC Recommendations (very short summary):

- 8-10 week pp run should have highest priority
- Cu-Cu run should accumulate an integrated delivered luminosity of at least 7 nb^{-1} at $\sqrt{s} = 200 \text{ GeV}$
- Cu-Cu at $\sqrt{s} = 62.4 \text{ GeV}$ and 1 day at injection is advisable if above goals are met
- 1-2 day pp (unpolarized) run at $\sqrt{s} = 400\text{-}500 \text{ GeV}$ desirable

RHIC Run 5 (22 GeV) Final Delivered Cu-Cu Luminosity



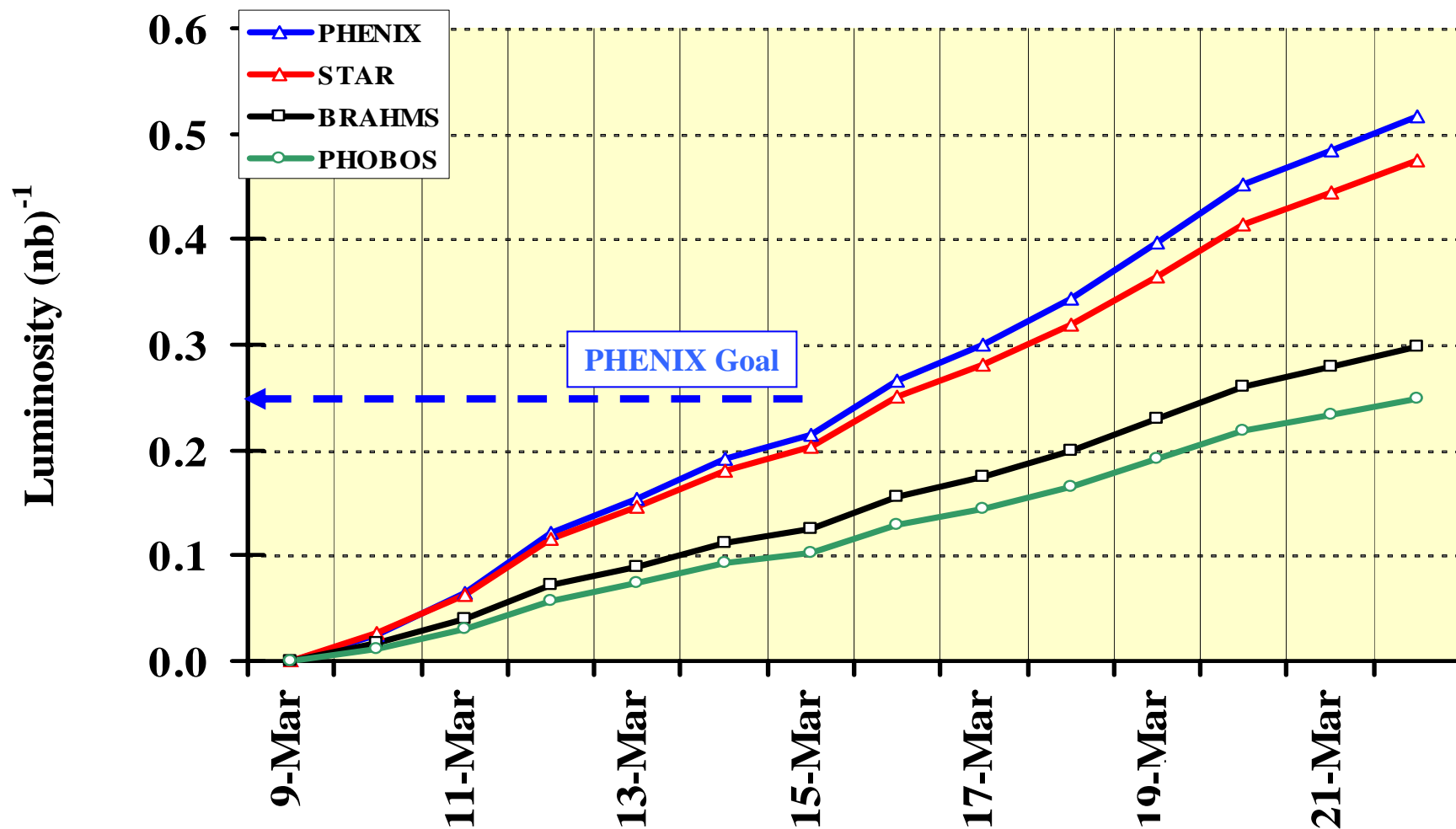


Total = 205.5 hours

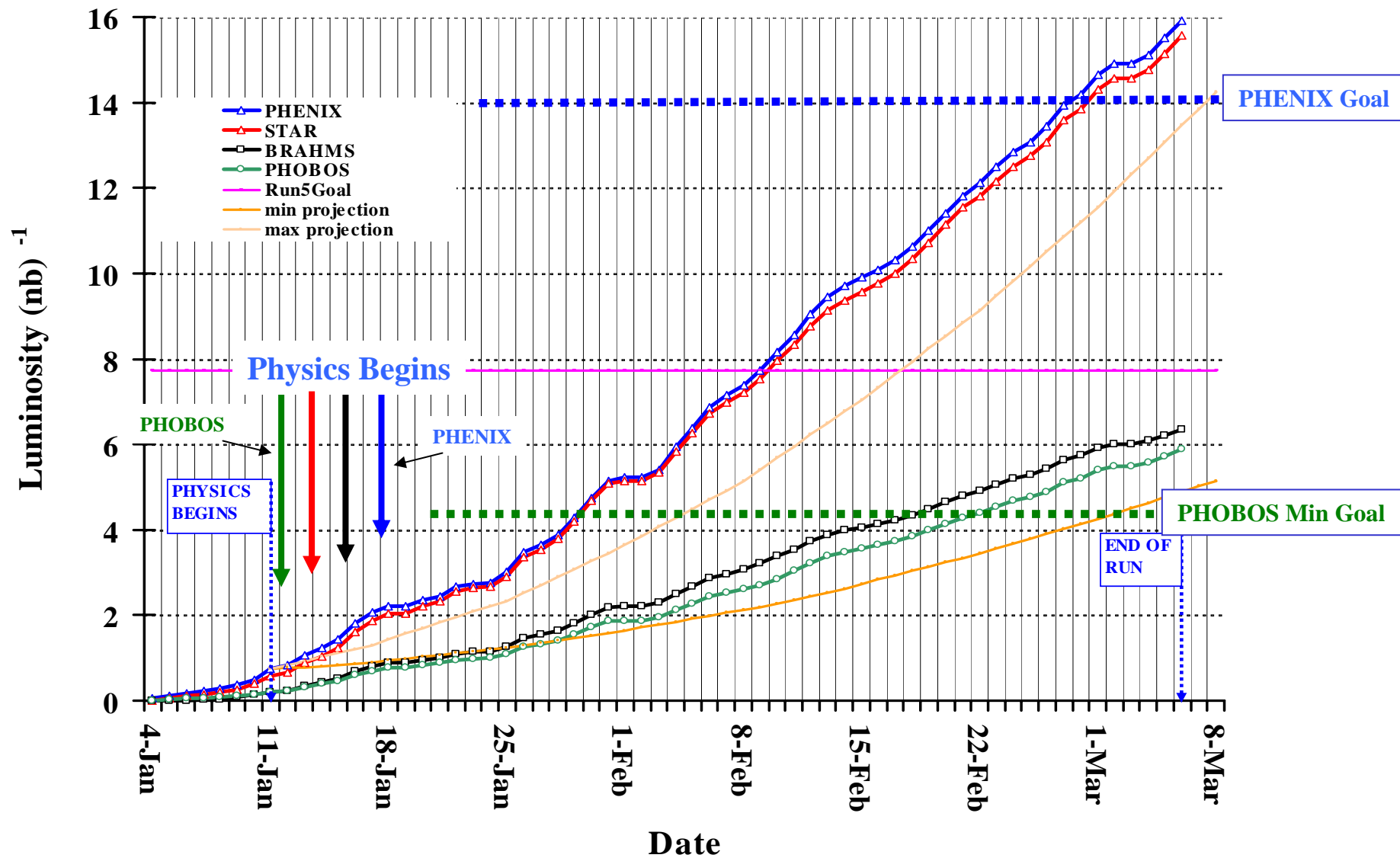
0130 10 Mar – 1330 22 Mar = 300 clock hours

68.5% or 115 hrs/week average

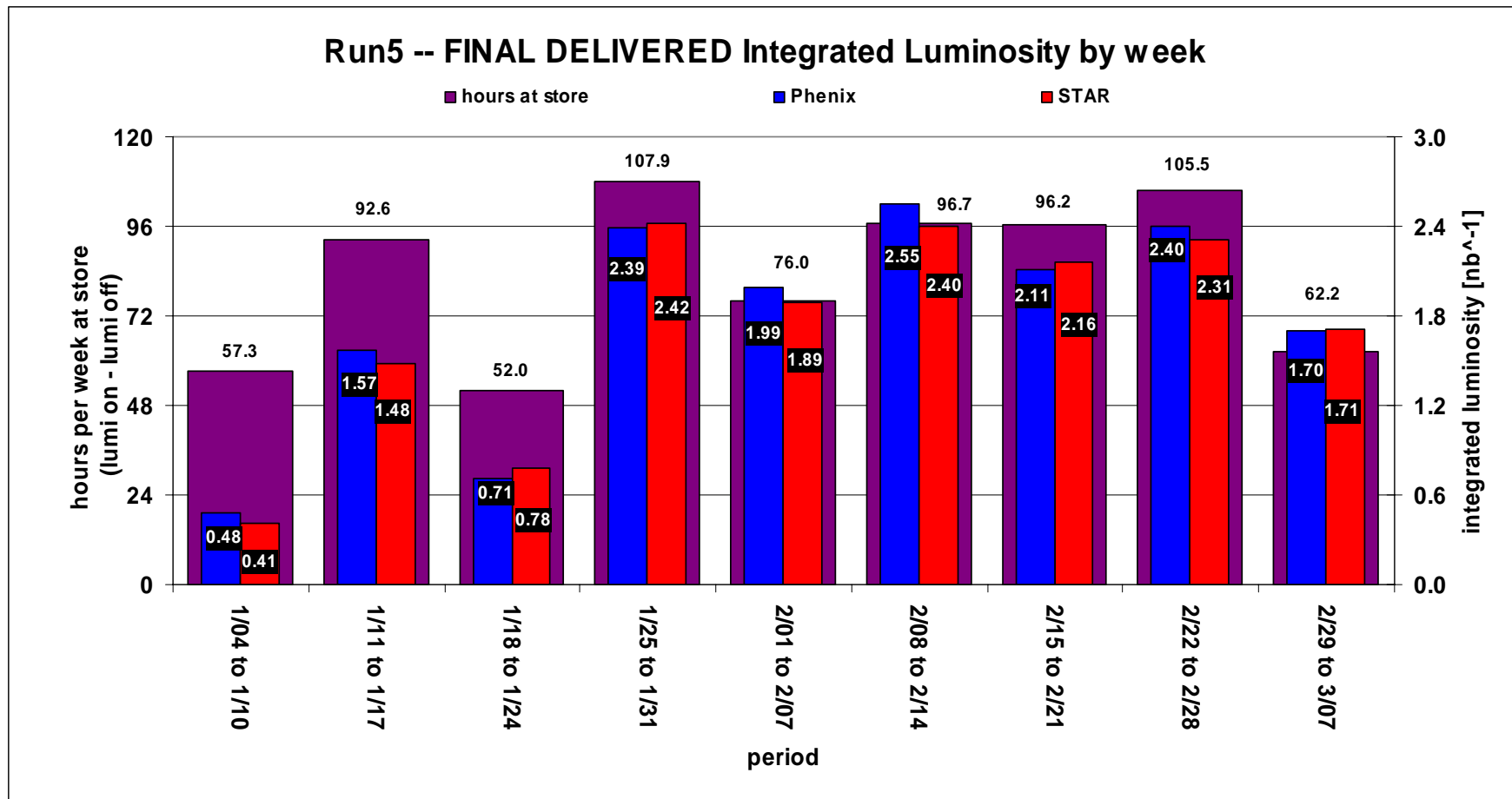
RHIC Run 5 (62 GeV) Final Delivered Cu-Cu Luminosity



RHIC Run 5 Final Delivered 100x100 GeV/n Cu-Cu Luminosity



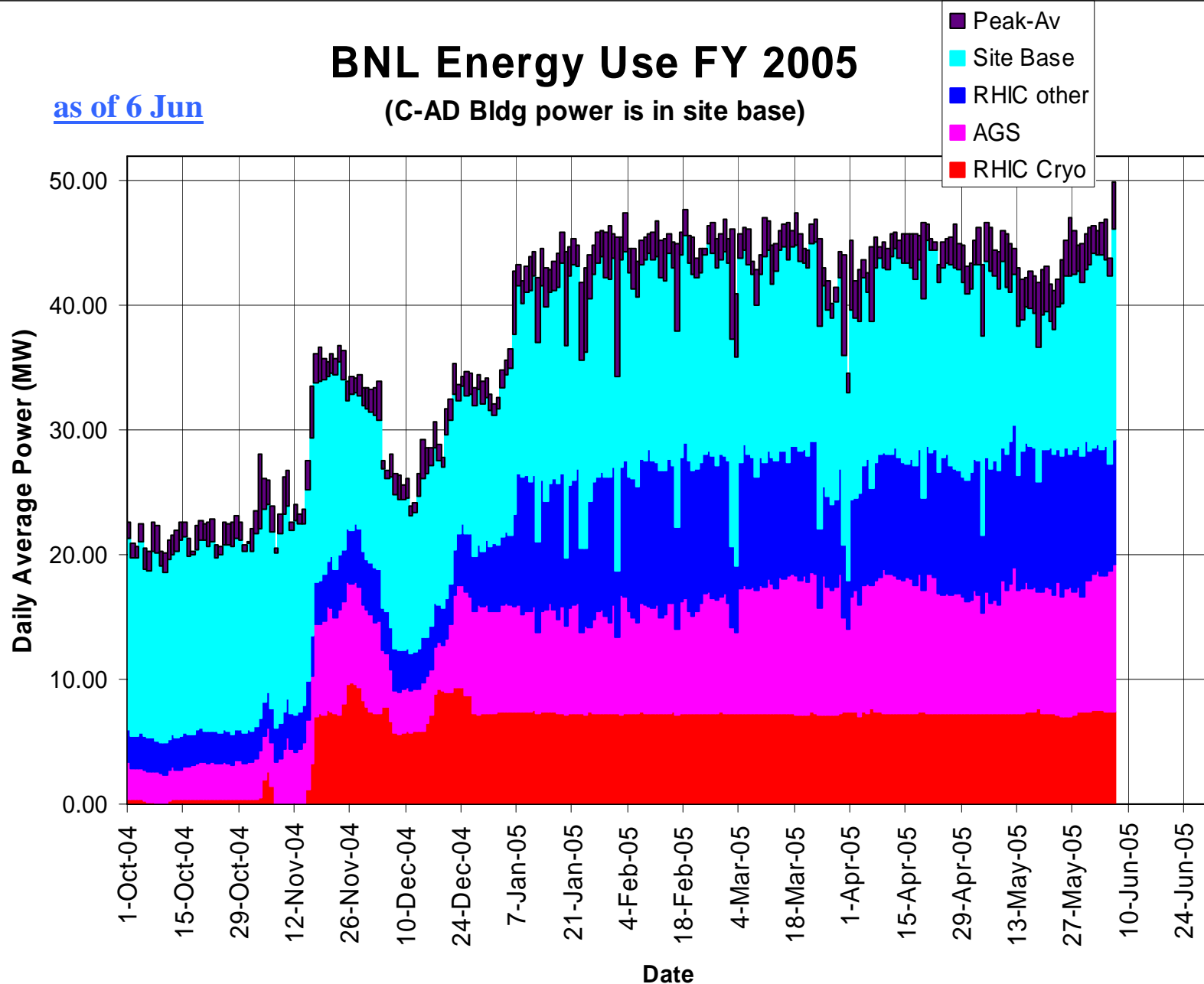
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BNL Energy Use FY 2005

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as of 6 Jun



RHIC Machine/Detector Planning Meeting

17 November 2004

Purpose of this meeting:

- To address issues and priorities relating to the optimization of physics output from RHIC experiments.
- To discuss and promulgate policy (when needed).